

Plants for Early Detection and Rapid Response (EDRR) in the East Central Florida Cooperative Invasive Species Management Area (ECF CISMA):

Brevard, Volusia, Flagler and Putnam Counties

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East Central Florida



Cooperative Invasive Species Management Area

The mission of the Cooperative Invasive Species Management Area of East Central Florida (ECF CISMA) is to implement a comprehensive, cooperative approach across boundaries to address the threats of invasive species to the lands and waters within the boundaries of

Brevard, Volusia, Flagler, and Putnam Counties. ECF CISMA was formed in June 2010.

The ECF CISMA needs your help to control invasive plants in East Central Florida. After an invasive species has been introduced, early detection and rapid response (EDRR) is the best tool to remove invaders before they cause problems. Public reports can help us detect new invaders and better understand the abundance and locations of established invasive species.

Even the best prevention efforts cannot stop all invasive species. EDRR is a critical second defense against the establishment of invasive populations. EDRR increases the likelihood that localized invasive populations will be found, contained, and eradicated before they become widely established. EDRR can slow range expansion and avoid the need for costly long-term control efforts.

Report Invasive Plants and Animals in Florida



Enter data for invasive plants and animals on EDDMaps at www.IveGot1.org or use the IveGot1 mobile app available for iPhone and Android.



What is EDDMaps?

- Real time tracking of invasive species occurrences
- Local and national distribution maps
- Electronic early detection reporting tools
- Library of identification and management information
- Also notify your local CISMA at www.FloridaInvasives.org



Information Needed

Species: Website provides drop-down menu

Infestation: Date and description

Location: County, lat/long, address OR location description, owner

IveGot1 Website & App Provides

- Location tools
- Image uploading capability

Call the hotline to report invasive animals

1-888-IVEGOT1 (1-888-483-4681)

Luziola subintegra

(Tropical American Watergrass)

Description: Robust emergent or submergent grass

- Large, thick culms 3 mm in diameter or larger.
- Leaves inflated and broad blades to 7 mm wide.
- Ligules from 1-4 cm (1.5 in) long.
- Flowers are monocious, with staminate and pistillate portions in separate panicles. Staminate panicle terminal, open, one fertile floret per spikelet.
- Pistillate panicle axillary, congested, barely exerted from the sheath, primary branches sharply recurved when mature, one fertile floret per spikelet.

Habitat: Lakes, rivers, creeks, marshes, prairies

Comments: Vouchered from Dade to Brevard Counties. Spreads vegetatively and by seed.

Control Methods:

- **Chemical:** Glyphosate (0.94 gpa) and Imazapyr (0.25 gpa)
- **Mechanical/Physical:** N/A
- **Biological:** N/A
- **Integrated:** N/A



Luziola subintegra
Photo by Jeff Schardt
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Tecoma capensis

(Cape Honeysuckle)

Description: Evergreen vining shrub

- Stems can grow 3-4 m (15-30 ft) long.
- Leaves pinnately compound, opposite, and serrate.
- Corolla tubular or funnel shaped and orange.
- Calyx not splitting on one side and becoming spathe-like.

Habitat: Popular ornamental. Thrives in wet and dry habitats with full to partial sun. Prefers well drained, fertile soils.

Comments: Flowers from Fall-Spring. Can withstand freezing temperatures.

Control Methods:

- **Chemical:** Triclopyr amine 3%
- **Mechanical/Physical:** N/A
- **Biological:** N/A
- **Integrated:** N/A



Lonicera japonica

(Japanese Honeysuckle)

Description: Woody, evergreen, twining vine

- Stems 25 to 36 m (25-118 ft) long.
- Younger stems red, slightly pubescent, and older stems have brown bark that peels.
- Leaves are ovate, 3.7 cm (1.5 in) long, opposite.
- Flowers are tubular, white turning yellow with age, fragrant.
- Fruits are black berries.

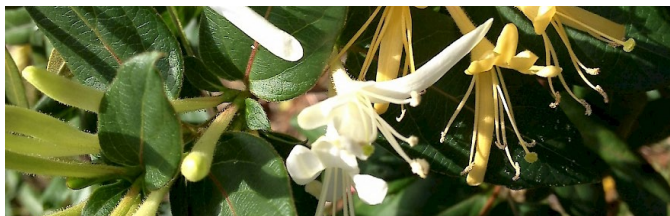
Habitat: Ruderal, open disturbed areas, forests

Comments: The native coral honeysuckle (*Lonicera sempervirens*) is like Japanese honeysuckle but differs in having leaves that the stem grows through, smooth stems, red flowers, and orange-red berries. Both species can grow together.

Control Methods:

- **Chemical:** Foliar (3-5% Triclopyr amine, 1-3% Glyphosate)

- **Mechanical/Physical:** Removal of vines by hand-pulling or hoeing is effective for small occurrences. Mowing can slow growth but may cause re-sprouting.
- **Biological:** N/A
- **Integrated:** Prescribed fire can help control Japanese honeysuckle in areas known to burn then treat regrowth with herbicide or hand pulling.



Hymenachne amplexicaulis

(West Indian Marsh Grass)

Description: Robust perennial wetland grass

- Ascending to 1 m (3 ft) tall, rooting at the lower nodes.
- Stems are floating, creeping or ascending. Stems are filled with a white pith (not hollow), unlike most other grasses.
- Leaf blades are flat, to 35 cm (14 in) long, cordate at the base and often clasping the stem.
- Inflorescence is dense and spike-like terminal panicle.

Habitat: Invades marshes, river edges, wet pastures

Comment: Resembles the native maidencane (*Panicum hemitomon*). Distinguished by its longer ligule (>1 mm), white pith, and more clasping leaf base.

Control Methods:

- **Chemical:** Imazapyr (96 fl. oz/ac/year, aquatic) or with Glyphosate (2% Glyphosate + 0.5% Imazapyr)
- **Mechanical/Physical:** Manipulation of water levels (drying, drowning plants)
- **Biological:** Myakka bug, *Ischnodemus variegatus* (Insecta: Hemiptera: Blissidae) was observed feeding

on West Indian marsh grass. This non-native insect greatly prefers this host plant relative to a few other native plants.

- **Integrated:** Using drawdowns with herbicide treatments



Melaleuca quinquenervia

(Melaleuca or Punktree)

Description: Tree

- White, papery, peeling, thick spongy bark.
- Grows to be 35 m (114 ft) high.
- Leaves are simple, alternate, pale green and have a sweet odor when crushed. Venation is often pale pink, and leaves are outlined in pale pink.
- Flowers resemble bottle brushes, feathery and seeming to emerge directly from the stem tips.
- Fruits are usually in clusters around stem tips.

Habitat: Wet flatwoods, disturbed sites

Comment: High fire and flood tolerance. May flower up to 5 times a year.

Control Methods:

- **Chemical:** Glyphosate, Imazapyr (read the label for guidance)
- **Mechanical/Physical:** Pull seedlings and saplings, taking care to remove roots.
- **Biological:** The weevil *Oxyops vitiosa*, the psyllid *Boreioglycaspis melaleucae*, and the gall midge

Lophodiplosis trifida have all been established in Florida.

- **Integrated:** Treat October-December, burn during dry season, herbicide seedlings, the following year.



Praxelis clematatidea

(Praxelis)

Description: A perennial aster

- Grows to 1.3 m (4.2 ft) tall.
- Leaves are opposite, hairy, coarsely toothed, and emit an odor like minty cat urine when crushed. Leaf blades are ovate with an acute tip, up to 8 cm (3 in) long and 5 cm (2 in) wide. The lower surface is gland-dotted.
- Flowers are small and bluish-purple, clustered into discoid heads.

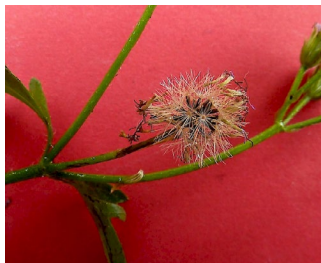
Habitat: Prefers disturbed, dry habitats including orange groves, road shoulders, and pine plantations.

Comment: Similar in appearance to *Ageratum* and *Conoclinium* species that occur in central and southern Florida.

Control Methods:

- **Chemical:** Glyphosate, Fluroxypyr, Metsulfuron-methyl, Triclopyr and 2,4-D
- **Mechanical/Physical:** Mowing when not in seed.
- **Biological:** N/A

- **Cultural:** Reportedly easy to kill but rebounds quickly from seed following prescribed burns. Multiple treatments needed.



Lygodium microphyllum

(Old World Climbing Fern)

Description: Climbing fern

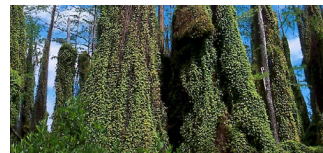
- Leafy branches off main rachis (constituting the pinnae) once compound, oblong in overall outline, 5-12 cm (2-5 in) long.
- Climbing, twining fronds of indeterminate growth, to 30 m (98 ft) long; main rachis (leaf stalk above petiole) wiry, stemlike.
- Leaflets (pinnules) usually unlobed, stalked, articulate (leaving wiry stalks when detached), glabrous below.
- Fertile leaflets of similar size, fringed with tiny lobes of enrolled leaf tissue covering the sporangia along the leaf margin.

Habitat: Hardwood hammocks, mesic flatwoods, forested swamps, wet flatwoods, hydric hammocks, floodplain forests, strand swamps, ruderal communities

Comment: May be confused with Japanese climbing fern (*Lygodium japonicum*), whose pinnae are often twice compound.

Control Methods:

- **Chemical:** Foliar spray to wet with 1-2% Glyphosate, 2% Triclopyr amine
- **Mechanical/Physical:** Poodle-cut plants that grow high into trees, manipulate water to higher levels for access and control spread near tree islands.
- **Biological:** Moth *Neomusotima conspurcatalis* and mite *Floracarus perrepae*
- **Integrated:** All the above



Ardisia elliptica

(Shoebutton Ardisia)

Description: Evergreen shrub to small tree

- Grows to 5 m (17 ft) tall.
- Glabrous leaves, alternate, to 20 cm (8 in) long, oblong to oval shaped, entire margins, fleshy, new foliage reddish.
- Star-shaped flowers in axillary clusters, petals mauve colored.
- Fruit is a round drupe, red turning black when ripe with white flesh.

Habitat: Coastal berms, maritime hammocks, hardwood hammocks, mesic flatwoods, strand swamps, cabbage palm hammocks, disturbed areas

Comment: Like the native marlberry (*Ardisia escallonioides*) or myrsine (*Rapanea punctata*) but is larger with conspicuous axillary clusters of mauve flowers.

Control Methods:

• **Chemical:**

- » Basal bark (10% Triclopyr ester)
- » Cut stump (50% Triclopyr amine)

» Broadcast foliar: In 50-gal solution mix per acre: 96 oz Imazapyr [25-28% a.i.], Use of 3% Metsulfuron-methyl greatly enhances efficacy of other herbicides.

• **Mechanical/Physical:** Aggressive tillage is an option and somewhat effective, but impractical in many areas. Hand pull seedlings.

• **Biological:** N/A

• **Integrated:** N/A



Colubrina asiatica

(Latherleaf)

Description: Sprawling evergreen shrub

- Often forming a tangled mat of glabrous stems.
- Slender branches to 9 m (30 ft) long.
- Oval, stalked, leaves are alternate, shiny dark green, 4-9 cm (1.5-3.5 in) long with toothed margins.
- Flowers small, greenish white, in small clusters at the leaf axils, 5 petals.
- Fruit a green to brown round capsule with 3 grayish-brown seeds inside.

Habitat: Coastal areas including hammocks, mangrove swamps, and buttonwood forests

Comment: Forms thick mats, growing over and shading out native vegetation. It also threatens several rare, listed native plant species.

Control Methods:

• **Chemical:**

- » Basal bark (10-20% Triclopyr ester or undiluted Pathfinder II)
- » Cut stump (50% Triclopyr amine)

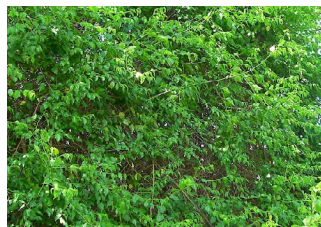
» Foliar (3% Triclopyr amine or Triclopyr ester)

» Follow up for 3-4 weeks. Repeat applications are necessary.

• **Mechanical/Physical:** Seedlings can be hand-pulled.

• **Biological:** N/A

• **Integrated:** N/A



Rhodomyrtus tomentosa

(Downy Rose-Myrtle)

Description: Evergreen shrub

- Grows to 2 m (6 ft) in height.
- Young stems have short dense hairs.
- Leaves are opposite, entire, elliptic-oval, glossy above and densely tomentose below, with three dominant veins originating from the leaf base.
- Attractive rose-pink flowers, 2.5 cm (1 in) across with five petals and a tuft of numerous stamens.
- Fruits are dark purple, globose, edible berries, 1.3 cm (0.5 in) across.

Habitat: Pine flatwoods

Comments: Introduced for ornamental value and edible fruit. Blooms profusely in spring. Fruits are sweet, likened to huckleberries. Highly adapted to fire and sprouts prolifically after fire.

Control Methods:

• **Chemical:**

- » Basal bark or cut stump: 10% - 20% Triclopyr
- » Foliar: 1% Imazapyr + 2% Glyphosate

• **Mechanical/Physical:** N/A

• **Biological:** N/A

• **Integrated:** N/A



Vitex rotundifolia

(Beach Vitex)

Description: Woody, deciduous shrub

- Growing 30 to 60 cm (11-23 in) tall.
- Procumbent stems sprawling to 5 m (16 ft) or more.
- Rooting at nodes, forming dense mats with age.
- Leaves suborbicular, opposite, 2 to 7 cm (0.5-3 in) long, blue-green above and light greenish-white below, pubescent, with spicy aroma when crushed.
- Flowers bluish-purple, to 2 cm long, in short terminal panicles to 8 cm (3 in) long. Fruits green, turning blue to black at maturity, to 6 mm in diameter.

Habitat: Beach dunes

Comment: Secretes allelopathic chemicals to suppress other plants from growing. Seeds viable in salt water up to 6 months. Less effective at dune stabilization than native species and reduces nesting for sea turtles.

Control Methods:

- **Chemical:** Imazapyr (1.2 g ai/cm). Paint onto wounds of stems created using a machete. Allow the plants to stay intact for 6 months following treatment. Repeat

this process until there is zero regrowth. Triclopyr has also been successful when used on seedlings and small-caliper resprouts.

- **Mechanical/Physical:** Sparse seedling populations can be pulled out manually. Cut in 2 ft sections and bag up to trap seeds.

- **Biological:** N/A

- **Integrated:** Removal using a machete, shears, or a pruning saw to slice stems diagonally, close to the ground and with the cut surface facing up, and then applying an herbicide to the exposed cuts. Thick stands of small seedlings or resprouts can be treated with a roller dipped in herbicide.



Cupaniopsis anacardioides

(Carrotwood)

Description: Evergreen tree

- Grows to 10 m tall (33 ft), usually single trunked.
- Leaves alternate, compound (4-12 oblong, stalked leaflets), leathery and shiny yellowish-green with entire margins and rounded tips.
- Numerous white to green tiny flowers in branched clusters in leaf axils.
- Fruit orange woody capsule with 3 distinct segments and 3 shiny oval seeds inside.

Habitat: Dunes, tropical hammocks, pinelands, mangrove swamps, scrub, coastal strands, cypress swamps

Comment: Carrotwood is a prolific seed producer, and the brightly colored fruits are very attractive to birds which disperse it widely.

Control Methods:

- **Chemical:**
 - » Basal bark (10-20% Triclopyr ester or undiluted Pathfinder II)

» Cut stump (10-50% Triclopyr amine or undiluted Glyphosate)

» Frill and girdle (10-20% Triclopyr ester)

- **Mechanical/Physical:** Mechanical harvesting then apply herbicide to regrowth.

- **Biological:** N/A

- **Integrated:** N/A



Ludwigia grandiflora ssp. *hexapetala*

(Large-Flower or Water Primrose Willow)

Description:

- Leaves attach alternately to the pubescent stems. In early growth stages the leaves usually have a rounded shape growing rosette-like around the villous stem. Once *L. grandiflora* begins to flower, the leaves lengthen, becoming much more lanceolate to elliptic in shape.
- Large yellow flowers that arise from the leaf axils. Each flower has 5-6 petals.
- Flowers are about 1-2 inches (2-5 cm) in diameter. The floral tube is noticeably shorter than the pedicel.
- The fruit of cylindrical capsule that is divided into 5 chambers. Fruits have a woody endocarp (inner layer). The seeds are embedded in the endocarp.

Habitat: Grows in riparian as well as aquatic habitats and forms large dense mats.

Comment: This plant can significantly alter habitats it invades by outcompeting native species, reducing water oxygen levels and blocking light.

Control Methods:

- **Chemical:** Carfentrazone (0.03 gpa) and Imazamox (0.25 gpa) or Flumioxazin (0.25 ppa) or Glyphosate (0.94 gpa) and Imazapyr (0.25 gpa)
- **Mechanical/Physical:** Mechanical harvesting is somewhat effective but expensive.
- **Biological:** N/A
- **Integrated:** Mechanical harvesting then herbicide regrowth.



Hyparrhenia rufa

(Jaraguagrass)

Description: A perennial grass, sometimes growing as an annual

- Forms dense clumps from rhizomes.
- The stalks range from 30 cm (2 in) to 3.5 m (11 ft) tall.
- The culms are 2-6mm in diameter and course.

Habitat: Canal banks, flatwoods, and disturbed sites

Comments: *H. rufa* is adapted to fire, both making fires more severe and proliferating after fire.

Control Methods:

- **Chemical:** 2% Glyphosate
- **Mechanical/Physical:** Small plants can be dug out by hand, though seeds persist in the ground and follow up control will be necessary.
- **Biological:** N/A
- **Integrated:** N/A



Casuarina glauca

(Gray Sheoak)

Description: Evergreen tree

- Grows to 20 m (70 ft) tall, with a dense, pyramidal shape. Bark gray-brown, finely fissured, scaly.
- Branchlets pine-needle-like, green, occasionally waxy, jointed, thin (< 1mm wide), 20-26 cm (8-10 in) long, minutely ridged, glabrous.
- Leaves reduced to tiny scales, in whorls of 10-17 at joints of branchlets.
- Flowers unisexual (dioecious), inconspicuous, female in small axillary clusters, male in small terminal spikes; female plants rare in Florida.
- Fruit a tiny, 1-seeded, winged nutlet (samara), formed in woody cone-like clusters (fruiting heads), these brown, to 1.8 cm (2/3 in) long and 0.9 cm (1/3 in) wide.

Habitat: Disturbed sites along riverbanks and in or near brackish water

Comments: Can reproduce via suckering roots especially with cut stump. Adapted to fire. Can displace native beach

plant communities that provide critical wildlife habitat for threatened and endangered plant and animal species.

Control Methods:

- **Chemical:** Method 240 SL using hack and squirt incision point/limited hack technique and Garlon 4 or 3A (read the label for guidance on application)
- **Mechanical/Physical:** Cut and pull small infestations and seedlings.
- **Biological:** N/A
- **Integrated:** N/A



To Be Watched

(Plants Not Yet Vouchered Into the ECF CISMA)

1. ***Azolla pinnata***

(Feathered Mosquito Fern)



2. ***Scleria microcarpa***

(Tropical Nutrush)



3. ***Zingiber zerumbet***

(Pinecone or Bitter Ginger)



4. ***Cryptocoryne walkeri***

(Water Trumpet)



5. ***Dichrostachys cinerea subsp. africana***

(Aroma or Sickie Pod)



6. ***Parthenium hysterophorus***

(Santa Maria Feverfew)



7. ***Stenochlaena tenuifolia***

(Giant Vine Fern)



Glossary

Acute: Tapering to a pointed apex to a sharp point and forming concave sides along the tip.

Allelopathic: Chemical inhibition of one plant (or other organism) by another, due to the release into the environment of substances acting as germination or growth inhibitors.

Allixary: Positioned in or arising in an axil.

Alternate: Born singly at each node, as leaves on a stem.

Articulate: Jointed.

Axil: The point of the upper angle formed between the axis of a stem and any part (usually a leaf) arising from it.

Axis: The longitudinal, central supporting structure or line around which various organs are borne, as a stem bearing leaves.

Branchlet: A small branch growing from a larger branch.

Calyx: The outer perianth whorl, collective term for all the sepals of the flower.

Capsule: A dry, dehiscent fruit composed of more than one carpel.

Compound: With two or more like parts in one organ.

Compound leaf: A leaf separated into two or more distinct leaflets.

Cordate: Heart-shaped, with a notch at the base.

Corolla: The collective name for all the petals of a flower; the inner perianth whorl.

Corolla tube: The hollow, cylindric portions of the corolla of united petals.

Culm: A hollow or pithy stalk or stem, as in the grasses, sedges, and rushes.

Deciduous: Plants that drop their leaves at the end of each growing season.

Dehiscence: The opening at maturity of fruits and anthers.

Dioecious: Having the male and female reproductive structures on separate plants.

Discoïd: Resembling a disc.

Drupe: A fleshy, indehiscent fruit with a stony endocarp surrounding a usually single seed, as in a peach or cherry.

Endocarp: The inner layer of the pericarp of a fruit.

Elliptic: In the shape of an ellipse, or a narrower at the two equal ends.

Emergent: Rising from, or standing out of, water.

Entire: Not toothed, notched, or divided, as the continuous margins of some leaves.

Evergreen: Having green leaves through the winter, not deciduous.

Fleshy: Thick and pulpy, succulent.

FronD: A large, divided leaf; a fern or palm leaf.

Glabrous: Without hairs.

Gland: An appendage, protuberance, or other structure with secretes sticky or oily substance.

Globose: Globe-shaped; spherical.

Glume: One of a pair of bracts at the base of a grass spikelet.

Indehiscent: A fruit that does not open when ripe to release its seeds.

Indeterminate: Describes an inflorescence in which the lower or outer flowers bloom first, allowing indefinite elongation of the main axis.

Inflated: Swollen or expanded; bladdery.

Inflorescence: The flowering part of a plant, a flower cluster, the arrangement of the flowers on the flowering axis.

Lanceolate: Lance-shaped; much longer than wide, with the widest point below the middle.

Ligule: The membranous appendage arising from the inner surface of the leaf at the junction with the leaf sheath in many grasses and some sedges.

Lobed: Bearing lobes which are cut less than halfway to the base or midvein.

Margin: The edge, as in the edge of a leaf blade.

Monoecious: Having the male and female reproductive structures on the same plant.

Node: The position on the stem where leaves or branches originate.

Oblong: Two or four times longer than broad with nearly parallel sides.

Opposite: Born across from one another at the same node, as in a stem with two leaves per node.

Oval: Broadly elliptic, the width over one-half the length.

Ovate: Egg-shaped in outline and attached at the broad end.

Panicle: A branched, racemose inflorescence with flowers maturing from the bottom upwards.

Pedice: The stalk of a single flower in an inflorescence, or of a grass spikelet.

Peduncle: The «stalk» or small stem-like portion of an inflorescence or flowering structure; a pedice is the comparable stalk attached to a fruit.

Perennial: A plant that lives three or more years.

Pinnate: Resembling a feather, as in a compound leaf with leaflets arranged on opposite sides of an elongated axis.

Pinnule: The pinnate division of a pinna in a bipinnately compound leaf, or the ultimate division of a leaf which is more than twice pinnately compound.

Pistil: The female reproductive organ of a flower, typically consisting of a stigma, style, and ovary.

Pith: The spongy parenchymatous central tissue in some stems and roots.

Procumbent: Lying or trailing on the ground, but not rooting at the nodes.

Pubescent: Covered with short, soft, erect hairs, cf. tomentose.

Pyramidal: Tetrahedral (4-sided, each side triangular); pyramid-shaped.

Rachis: The main axis of a structure, such as a compound leaf or an inflorescence.

Rhizome: a continuously growing horizontal underground stem which puts out lateral shoots and adventitious roots at intervals.

Rosette: a dense radiating cluster of leaves (or other organs), usually at or near ground level.

Samara: A dry, indehiscent fruit with its wall expanded into a wing or wings.

Serrate: Saw-like; toothed along the margin, the sharp teeth pointing forward.

Shrub: A woody plant with several stems, that is shorter than the typical tree.

Simple: Undivided, as a leaf blade which is not separated into leaflets (though the blade may be deeply lobed or cleft).

Solitary: Occurring singly and not borne in a cluster or group.

Spathe: A large bract or pair of bracts subtending and often enclosing an inflorescence.

Spikelet: Small spike or secondary spike; the ultimate flower cluster of grasses and sedges, consisting of 1-many flowering subtended by two bracts (glumes).

Sporangia: A spore-bearing case or sac.

Stalk: The supporting structure of an organ, usually narrower in diameter than the organ.

Stamen: The male reproductive organ of a flower, consisting of an anther and filament.

Stem: the portion of the plant axis bearing nodes, leaves, and buds and usually found above ground.

Submergent: Part or all the plant below the water surface.

Suborbicular: Almost orbicular in shape.

Sucker: A shoot originating from below ground.

Terminal: At the tip or apex.

Tomentose: Covered with dense, matted, wooly hairs.

Tooth: Any small lobe or point along the margin.

Tubular: With the form of a tube or cylinder.

Venation: The pattern of veining on the leaf.

Villous: Bearing long, soft, shaggy, but unmatted, hairs.

Vine: A plant with the stem not self-supporting but climbing or trailing on some support.

Control Methods

Basal Bark: A band of oil-based herbicide is sprayed onto the smooth bark of young trees around the entire trunk using a backpack sprayer or spray bottle. Thorough wetting is necessary for good control. Efficacy is reduced on older trees with thick bark.

Burning: Smaller infestations and individual selective spot treatments can be burned using a flame thrower or weed burning device. Prescribed burning in fields or open areas is a non-selective method and should be conducted only by properly-trained individuals.

Cut Stump: Herbicide (water or oil based) is applied to the cut stumps and branches of trees, shrubs, or

woody vines. This control method should be considered when treating individual plants or in locations where the presence of desirable species eliminates the option of foliar application.

Foliar Spray: Is a rapid and efficient technique using a direct spray of herbicide into the leaves (spray to wet) of target plants using a hand-held sprayer or boom sprayer. To minimize damage to non-target plants, be cautious of winds (spray drift) and high temperatures (chemical volatility). A low-pressure tank with a controlled spray works well.

Girdling: Cut away a strip of bark several centimeters wide all the

way around the trunk. Cut deep enough into the trunk to remove the vascular cambium, or inner bark, the thin layer of living tissue that moves sugars and other carbohydrates between areas of production (leaves), storage (roots), and growing points.

Hack and Squirt: When using this method, a water-based herbicide is applied with a spray bottle to downward incision cuts made with a machete, axe, or hatchet and spaced out along woody stems. For larger trunks and difficult to control species, connect incision (frilling) around entire circumference may be required.

Poodle-cut: Cut the plant at waist height, using a stick to pull vines away from underlying vegetation that you do not want to damage. Cut enough of the plant so that you leave a gap of 10-12 inches between the upper and lower portions of the vine. The plant will die above the cut, although it may still release spores. Treat the remaining rooted portion of the plant with herbicide.

NOTE: Check all information for updates, particularly control methods. Verify plant identification with an expert before initiating any control method.

Plant Identification text and image references and resources:

Identification & Biology of Non-Native Plants in Florida's Natural Areas by K.A. Langeland and K. Craddock Burks, Eds. (1998, 2008). University of Florida, IFAS, SP 257.

Plant Identification Terminology by James G. Harris and Melinda Woolf Harris, 2nd Edition (1994 & 2001).



**UF/IFAS Assessment of Non-Native
Plants in Florida's Natural Areas,**
assessment.ifas.ufl.edu



Atlas of Florida Plants,
University of South Florida,
florida.plantatlas.usf.edu



UF/IFAS Extension, EDIS,
edis.ifas.ufl.edu



**The Center for Invasives Species
and Ecosystem Health,**
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